



# FCC RF Test Report

APPLICANT : Locus Solutions,LLC  
EQUIPMENT : GO Tracker 1.5  
BRAND NAME : Emerson  
MODEL NAME : GO Tracker 1.5  
FCC ID : AMH101011  
STANDARD : 47 CFR Part 2, and 90(S)  
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was installed a module during the test: Quectel BG96 Module (Model name: BG96, FCC ID: XMR201707BG96).

The product was received on Nov. 12, 2019 and completely tested on Dec. 10, 2019. We, Sporton International (ShenZhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (ShenZhen) Inc., the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager



**Sporton International (ShenZhen) Inc.**

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055  
People's Republic of China



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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FW9N1204   | Rev. 01 | Initial issue of report | Jan. 08, 2020 |
|            |         |                         |               |
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|            |         |                         |               |

## SUMMARY OF TEST RESULT

| Report Section | FCC Rule           | Description                                      | Limit                               | Result | Remark                                     |
|----------------|--------------------|--------------------------------------------------|-------------------------------------|--------|--------------------------------------------|
| 3.1            | §2.1046            | Conducted Output Power                           | Reporting only                      | PASS   | -                                          |
| -              | §2.1049<br>§90.209 | Occupied Bandwidth and<br>26dB Bandwidth         | Reporting only                      | PASS   | 1                                          |
| -              | §2.1051<br>§90.691 | Emission masks –<br>In-band emissions            | $< 50+10\log_{10}(P[\text{Watts}])$ | PASS   | 1                                          |
| -              | §2.1051<br>§90.691 | Emission masks –<br>Out of band emissions        | $< 43+10\log_{10}(P[\text{Watts}])$ | PASS   | 1                                          |
| 3.2            | §2.1053<br>§90.691 | Field Strength of Spurious<br>Radiation          | $< 43+10\log_{10}(P[\text{Watts}])$ | PASS   | Under limit<br>44.12 dB at<br>2450.250 MHz |
| -              | §2.1055<br>§90.213 | Frequency Stability for<br>Temperature & Voltage | $< 2.5 \text{ ppm}$                 | PASS   | 1                                          |

**Remark 1:** For LTE Category M1, the conducted test items were leverage from module RF report which can refer to Report No. "RXA1706-0199RF04R1", For NB-IOT Category NB1, the conducted test items were leverage from module RF report which can refer to Report No. "RXA1706-0199RF08"

### Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

### Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



# 1 General Description

## 1.1 Applicant

Locus Solutions,LLC

7121 Fairway Dr. Suite #400 | Palm Beach Gardens, FL 33418 USA

## 1.2 Manufacturer

Queclink Wireless Solutions Co., Ltd.

3 Floor, Building 2, No.717 Yishan Road, Xuhui District, shanghai, China 200233

## 1.3 Feature of Equipment Under Test

| Product Feature                 |                                                              |
|---------------------------------|--------------------------------------------------------------|
| Equipment                       | GO Tracker 1.5                                               |
| Brand Name                      | Emerson                                                      |
| Model Name                      | GO Tracker 1.5                                               |
| FCC ID                          | AMH101011                                                    |
| EUT supports Radios application | GSM/LTE Category M1/NB-IOT Category NB1                      |
| IMEI Code                       | 862061041481382 for Sample 1<br>862061041480590 for Sample 2 |
| HW Version                      | V1.03                                                        |
| SW Version                      | R00A01V19                                                    |
| EUT Stage                       | Production Unit                                              |

### Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two types of EUT: sample 1 with a battery of 1800mAh capacity and sample 2 with a battery of 4000mAh capacity.

## 1.4 Product Specification of Equipment Under Test

| Product Specification subjective to this standard |                                                                                      |
|---------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Tx Frequency</b>                               | LTE Category M1: 814.7 ~ 823.3 MHz<br>NB-IOT Category NB1 : 814.1 MHz ~ 823.9 MHz    |
| <b>Rx Frequency</b>                               | LTE Category M1: 859.7 ~ 868.3 MHz<br>NB-IOT Category NB1 : 859.1 MHz ~ 868.9 MHz    |
| <b>Bandwidth</b>                                  | LTE Category M1: 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz<br>NB-IOT Category NB1: 200KHz |
| <b>Sub-carrier Spacing</b>                        | NB-IOT Category NB1 : 3.75KHz / 15KHz                                                |
| <b>Maximum Output Power to Antenna</b>            | LTE Category M1: 22.72 dBm<br>NB-IOT Category NB1 : 23.04 dBm                        |
| <b>Antenna Gain</b>                               | -5.51 dBi                                                                            |
| <b>Type of Modulation</b>                         | LTE Category M1: QPSK / 16QAM<br>NB-IOT Category NB1 : BPSK / QPSK                   |

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.6 Maximum Conducted Power

LTE Category M1

| FCC Rule | System      | Type of Modulation | BW      | Frequency Tolerance (ppm) | Emission Designator | Maximum Conducted power(W) |
|----------|-------------|--------------------|---------|---------------------------|---------------------|----------------------------|
| Part 90S | LTE Band 26 | QPSK               | 1.4 MHz | -                         | -                   | 0.1816                     |
| Part 90S | LTE Band 26 | 16QAM              | 1.4 MHz | -                         | -                   | 0.1854                     |
| Part 90S | LTE Band 26 | QPSK               | 3 MHz   | -                         | -                   | 0.1811                     |
| Part 90S | LTE Band 26 | 16QAM              | 3 MHz   | -                         | -                   | 0.1778                     |
| Part 90S | LTE Band 26 | QPSK               | 5 MHz   | -                         | -                   | 0.1828                     |
| Part 90S | LTE Band 26 | 16QAM              | 5 MHz   | -                         | -                   | 0.1795                     |
| Part 90S | LTE Band 26 | QPSK               | 10 MHz  | -                         | -                   | 0.1734                     |
| Part 90S | LTE Band 26 | 16QAM              | 10 MHz  | -                         | -                   | 0.1824                     |
| Part 90S | LTE Band 26 | QPSK               | 15 MHz  | -                         | -                   | 0.1871                     |
| Part 90S | LTE Band 26 | 16QAM              | 15 MHz  | -                         | -                   | 0.1858                     |

NB-IOT Category NB1

| FCC Rule | System      | Type of Modulation | Sub-carrier Spacing | Frequency Tolerance (ppm) | Emission Designator | Maximum Conducted power(W) |
|----------|-------------|--------------------|---------------------|---------------------------|---------------------|----------------------------|
| Part 90S | LTE Band 26 | BPSK               | 3.75 KHz            | -                         | -                   | 0.1786                     |
| Part 90S | LTE Band 26 | QPSK               | 3.75 KHz            | -                         | -                   | 0.1795                     |
| Part 90S | LTE Band 26 | BPSK               | 15 KHz              | -                         | -                   | 0.1995                     |
| Part 90S | LTE Band 26 | QPSK               | 15 KHz              | -                         | -                   | 0.2014                     |

## 1.7 Testing Site

Sporton International (Shenzhen) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

|                           |                                                                                                                                                           |                            |                                       |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|
| <b>Test Firm</b>          | Sporton International (Shenzhen) Inc.                                                                                                                     |                            |                                       |
| <b>Test Site Location</b> | No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan Shenzhen, 518055 People's Republic of China<br>TEL: +86-755-33202398 |                            |                                       |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>                                                                                                                                   | <b>FCC Designation No.</b> | <b>FCC Test Firm Registration No.</b> |
|                           | 03CH04-SZ                                                                                                                                                 | CN1256                     | 421272                                |

## 1.8 Test Software

| Item | Site      | Manufacture | Name | Version     |
|------|-----------|-------------|------|-------------|
| 1.   | 03CH04-SZ | AUDIX       | E3   | 6.2009-8-24 |



## 1.9 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 90(S)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 971168 D02 Misc Rev Approv License Devices v02r01

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Frequency range investigated for radiated emission is 30 MHz to 10th harmonic

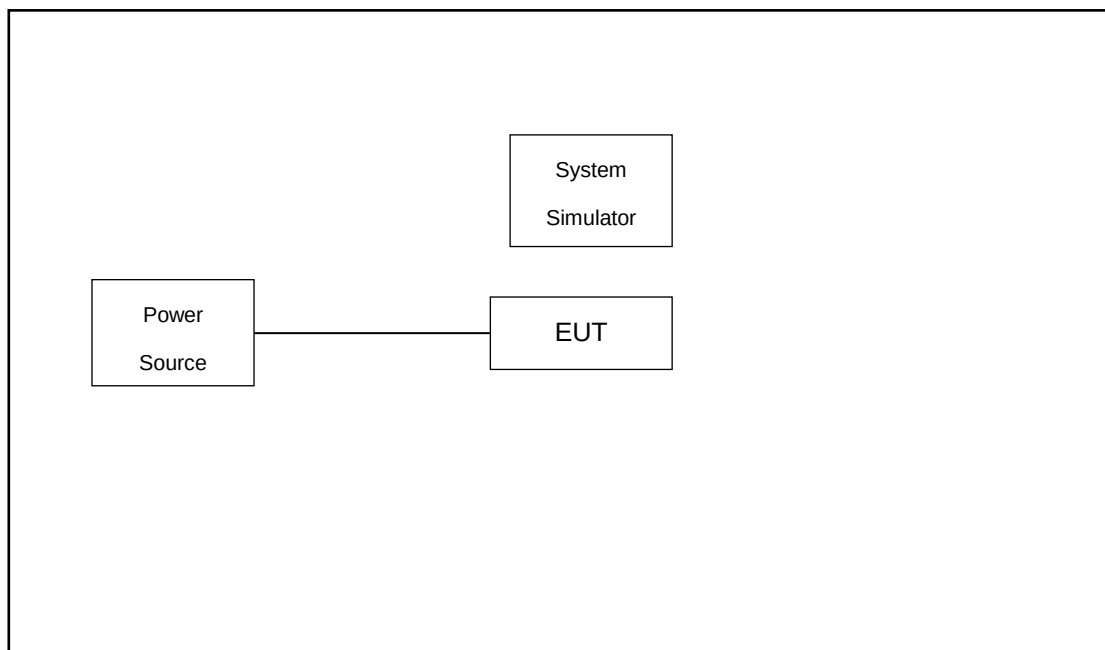
LTE Category M1:

| Test Items                 | Band                                                                                                                                                                                                                                                                                                                                                                                                      | Bandwidth (MHz) |   |   |    |    |    | Modulation |       | RB # |      |      | Test Channel |   |   |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---|---|----|----|----|------------|-------|------|------|------|--------------|---|---|
|                            |                                                                                                                                                                                                                                                                                                                                                                                                           | 1.4             | 3 | 5 | 10 | 15 | 20 | QPSK       | 16QAM | 1    | Half | Full | L            | M | H |
| Max. Output Power          | 26                                                                                                                                                                                                                                                                                                                                                                                                        | v               | v | v | v  | v  | -  | v          | v     | v    | v    | v    | v            | v | v |
| Radiated Spurious Emission | 26                                                                                                                                                                                                                                                                                                                                                                                                        | v               | v | v | v  | v  | -  | v          |       | v    |      |      | v            | v | v |
| Note                       | 1. The mark "v" means that this configuration is chosen for testing<br>2. The mark "-" means that this bandwidth is not supported.<br>3. LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824MHz. ERP over 15MHz bandwidth complies the ERP limit line of part22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies. |                 |   |   |    |    |    |            |       |      |      |      |              |   |   |

NB-IOT Category NB:

| Test Items                 | Band                                                                                                                                                                                                                                                                                                                                                                                                      | Sub-carrier Spacing (KHz) |    | Modulation |      | Tones # |   |    | Test Channel |   |   |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----|------------|------|---------|---|----|--------------|---|---|
|                            |                                                                                                                                                                                                                                                                                                                                                                                                           | 3.75                      | 15 | BPSK       | QPSK | 1       | - | 12 | L            | M | H |
| Max. Output Power          | 26                                                                                                                                                                                                                                                                                                                                                                                                        | v                         | v  | v          | v    | v       | - | v  | v            | v | v |
| Radiated Spurious Emission | 26                                                                                                                                                                                                                                                                                                                                                                                                        | v                         | v  | v          | v    | -       | - | v  | v            | v | v |
| Note                       | 1. The mark "v" means that this configuration is chosen for testing<br>2. The mark "-" means that this bandwidth is not supported.<br>3. LTE Band26 transmit frequency for part22 rule is 824MHz-849MHz, for part90 rule is 814MHz-824MHz. ERP over 15MHz bandwidth complies the ERP limit line of part22 rule, therefore ERP of the partial frequency spectrum which falls within part 22 also complies. |                           |    |            |      |         |   |    |              |   |   |

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

| Item | Equipment        | Trade Name | Model No. | FCC ID | Data Cable | Power Cord        |
|------|------------------|------------|-----------|--------|------------|-------------------|
| 1.   | System Simulator | Anritsu    | MT8820C   | N/A    | N/A        | Unshielded, 1.8 m |

## 2.4 Frequency List of Low/Middle/High Channels

LTE Category M1

| LTE Band 26 Channel and Frequency List |                        |        |        |         |
|----------------------------------------|------------------------|--------|--------|---------|
| BW [MHz]                               | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 15                                     | Channel                | 26765  | -      | -       |
|                                        | Frequency              | 821.5  | -      | -       |
| 10                                     | Channel                | -      | 26740  | -       |
|                                        | Frequency              | -      | 819    | -       |
| 5                                      | Channel                | 26715  | 26740  | 26765   |
|                                        | Frequency              | 816.5  | 819    | 821.5   |
| 3                                      | Channel                | 26705  | 26740  | 26775   |
|                                        | Frequency              | 815.5  | 819    | 822.5   |
| 1.4                                    | Channel                | 26697  | 26740  | 26783   |
|                                        | Frequency              | 814.7  | 819    | 823.3   |

NB-IOT Category NB1

| LTE Band 26 Channel and Frequency List |                         |        |        |         |
|----------------------------------------|-------------------------|--------|--------|---------|
| Sub-carrier Spacing (KHz)              | Channel/Frequency (MHz) | Lowest | Middle | Highest |
| 3.75                                   | Channel                 | 26691  | 26740  | 26789   |
|                                        | Frequency               | 814.1  | 819    | 823.9   |
| 15                                     | Channel                 | 26691  | 26740  | 26789   |
|                                        | Frequency               | 814.1  | 819    | 823.9   |

### 3 Test Result

#### 3.1 Conducted Output Power Measurement

##### 3.1.1 Description of the Conducted Output Power Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

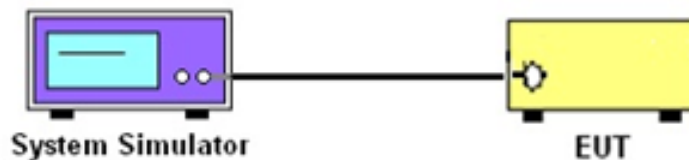
##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through the system simulator.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

##### 3.1.4 Test Setup



##### 3.1.5 Test Result of Conducted Output Power

Please refer to Appendix A.

## 3.2 Field Strength of Spurious Radiation Measurement

### 3.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI/TIA-603-E. The power of any emission FCC Part 90.691 on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth at least  $43 + 10 \log(P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log_{10}(P[\text{Watts}])$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 3.2.2 Measuring Instruments

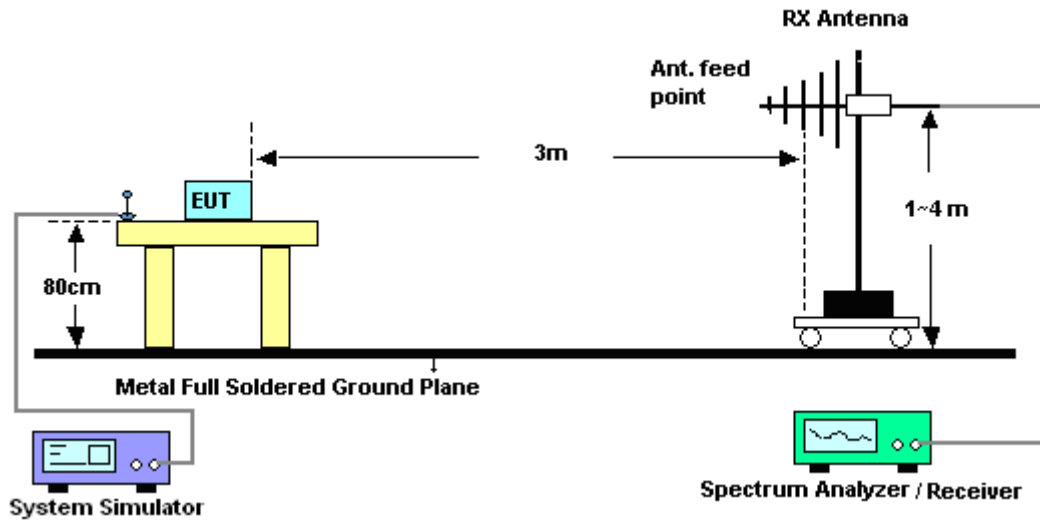
The measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

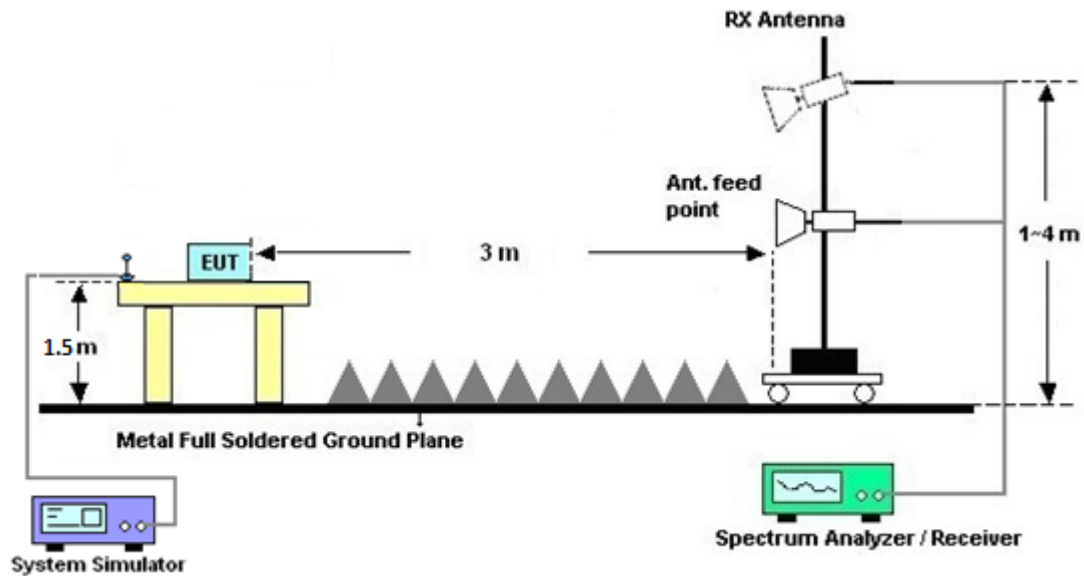
1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10.  $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
11.  $\text{ERP (dBm)} = \text{EIRP} - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from  $43 + 10 \log(P)$  dB below the transmitter power P(Watts)

### 3.2.4 Test Setup

For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



### 3.2.5 Test Result of Field Strength of Spurious Radiated

Please refer to Appendix B.



## 4 List of Measuring Equipment

| Instrument                | Manufacturer         | Model No.                | Serial No. | Characteristics | Calibration Date | Test Date     | Due Date      | Remark                |
|---------------------------|----------------------|--------------------------|------------|-----------------|------------------|---------------|---------------|-----------------------|
| EXA Spectrum Analyzer     | KEYSIGHT             | N9010A                   | MY55150213 | 10Hz~44GHz      | Apr. 18, 2019    | Dec. 10, 2019 | Apr. 17, 2020 | Radiation (03CH04-SZ) |
| Bilog Antenna             | TeseQ                | CBL6111D                 | 41909      | 30MHz~1GHz      | Aug. 27, 2019    | Dec. 10, 2019 | Aug. 26, 2020 | Radiation (03CH04-SZ) |
| Double Ridge Horn Antenna | SCHWARZBECK          | BBHA9120D                | 9120D-1474 | 1GHz~18GHz      | Apr. 01, 2019    | Dec. 10, 2019 | Mar. 31, 2020 | Radiation (03CH04-SZ) |
| Horn Antenna              | SCHWARZBECK          | BBHA9170                 | 9170#679   | 15GHz~40GHz     | Apr. 19, 2019    | Dec. 10, 2019 | Apr. 18, 2020 | Radiation (03CH04-SZ) |
| Amplifier                 | Burgeon              | BPA-530                  | 102211     | 0.01Hz~3000MHz  | Oct. 18, 2019    | Dec. 10, 2019 | Oct. 17, 2020 | Radiation (03CH04-SZ) |
| HF Amplifier              | MITEQ                | AMF-7D-00101800-30-10P-R | 1943528    | 1GHz~18GHz      | Oct. 18, 2019    | Dec. 10, 2019 | Oct. 17, 2020 | Radiation (03CH04-SZ) |
| HF Amplifier              | MITEQ                | TTA1840-35-HG            | 1871923    | 18GHz~40GHz     | Jul. 22, 2019    | Dec. 10, 2019 | Jul. 21, 2020 | Radiation (03CH04-SZ) |
| Amplifier                 | Agilent Technologies | 83017A                   | MY53270156 | 500MHz~26.5GHz  | Aug. 26, 2019    | Dec. 10, 2019 | Aug. 25, 2020 | Radiation (03CH04-SZ) |
| AC Power Source           | Chroma               | 61601                    | N/A        | N/A             | NCR              | Dec. 10, 2019 | NCR           | Radiation (03CH04-SZ) |
| Turn Table                | EM                   | EM1000                   | N/A        | 0~360 degree    | NCR              | Dec. 10, 2019 | NCR           | Radiation (03CH04-SZ) |
| Antenna Mast              | EM                   | EM1000                   | N/A        | 1 m~4 m         | NCR              | Dec. 10, 2019 | NCR           | Radiation (03CH04-SZ) |

NCR: No Calibration Required

## 5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage  $K=2$  to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 2.8dB |
|-------------------------------------------------------------------------|-------|

### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 3.1dB |
|-------------------------------------------------------------------------|-------|

### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 3.9dB |
|-------------------------------------------------------------------------|-------|





## Appendix A. Test Results of Conducted Test

### Conducted Output Power (Average power)

LTE Category M1

| LTE Band 26 Maximum Average Power [dBm] |        |         |           |       |   |    |        |        |         |
|-----------------------------------------|--------|---------|-----------|-------|---|----|--------|--------|---------|
| BW [MHz]                                | Mod    | RB Size | RB Offset | Index |   |    | Lowest | Middle | Highest |
|                                         |        |         |           | L     | M | H  |        |        |         |
| 15                                      | QPSK   | 1       | 0         | 0     | 0 | 11 | 22.45  | -      | -       |
| 15                                      |        | 1       | 5         | 0     | 0 | 11 | 22.39  |        |         |
| 15                                      |        | 6       | 0         | 0     | 0 | 11 | 22.72  |        |         |
| 15                                      | 16-QAM | 1       | 0         | 0     | 0 | 11 | 22.50  |        |         |
| 15                                      |        | 1       | 5         | 0     | 0 | 11 | 22.39  |        |         |
| 15                                      |        | 6       | 0         | 0     | 0 | 11 | 22.69  |        |         |
| 10                                      | QPSK   | 1       | 0         | 0     | 0 | 7  |        | 22.28  |         |
| 10                                      |        | 1       | 5         | 0     | 0 | 7  |        | 22.19  |         |
| 10                                      |        | 6       | 0         | 0     | 0 | 7  |        | 22.39  |         |
| 10                                      | 16-QAM | 1       | 0         | 0     | 0 | 7  |        | 22.45  |         |
| 10                                      |        | 1       | 5         | 0     | 0 | 7  |        | 22.25  |         |
| 10                                      |        | 6       | 0         | 0     | 0 | 7  |        | 22.61  |         |
| 5                                       | QPSK   | 1       | 0         | 0     | 0 | 3  | 22.54  | 22.26  | 22.62   |
| 5                                       |        | 1       | 5         | 0     | 0 | 3  | 22.24  | 22.19  | 22.57   |
| 5                                       |        | 6       | 0         | 0     | 0 | 3  | 22.48  | 22.29  | 22.43   |
| 5                                       | 16-QAM | 1       | 0         | 0     | 0 | 3  | 22.54  | 21.08  | 21.66   |
| 5                                       |        | 1       | 5         | 0     | 0 | 3  | 22.33  | 21.32  | 21.55   |
| 5                                       |        | 6       | 0         | 0     | 0 | 3  | 22.51  | 21.94  | 22.20   |



| LTE Band 26 Maximum Average Power [dBm] |        |         |           |       |   |   |        |        |         |
|-----------------------------------------|--------|---------|-----------|-------|---|---|--------|--------|---------|
| BW [MHz]                                | Mod    | RB Size | RB Offset | Index |   |   | Lowest | Middle | Highest |
|                                         |        |         |           | L     | M | H |        |        |         |
| 3                                       | QPSK   | 1       | 0         | 0     | 0 | 1 | 22.24  | 22.48  | 22.55   |
| 3                                       |        | 1       | 5         | 0     | 0 | 1 | 22.23  | 22.23  | 22.46   |
| 3                                       |        | 6       | 0         | 0     | 0 | 1 | 22.52  | 22.58  | 22.40   |
| 3                                       | 16-QAM | 1       | 0         | 0     | 0 | 1 | 22.28  | 21.42  | 21.34   |
| 3                                       |        | 1       | 5         | 0     | 0 | 1 | 22.37  | 21.18  | 21.39   |
| 3                                       |        | 6       | 0         | 0     | 0 | 1 | 22.50  | 21.94  | 22.44   |
| 1.4                                     | QPSK   | 1       | 0         | 0     | 0 | 0 | 22.23  | 22.38  | 22.59   |
| 1.4                                     |        | 1       | 5         | 0     | 0 | 0 | 22.47  | 22.47  | 22.56   |
| 1.4                                     |        | 6       | 0         | 0     | 0 | 0 | 22.53  | 22.52  | 22.45   |
| 1.4                                     | 16-QAM | 1       | 0         | 0     | 0 | 0 | 22.30  | 21.35  | 21.36   |
| 1.4                                     |        | 1       | 5         | 0     | 0 | 0 | 22.32  | 21.28  | 21.45   |
| 1.4                                     |        | 6       | 0         | 0     | 0 | 0 | 22.68  | 22.16  | 22.46   |

NB-IOT Category NB1:

| LTE Band 26 Maximum Average Power [dBm] |      |       |       |        |        |         |
|-----------------------------------------|------|-------|-------|--------|--------|---------|
| Sub-carrier Spacing (KHz)               | Mod  | Tones | Start | Lowest | Middle | Highest |
| 3.75                                    | BPSK | 1     | 0     | 22.49  | 22.49  | 22.32   |
| 3.75                                    |      | 1     | 47    | 22.46  | 22.52  | 22.35   |
| 3.75                                    | QPSK | 1     | 0     | 22.41  | 22.50  | 22.37   |
| 3.75                                    |      | 1     | 47    | 22.47  | 22.54  | 22.43   |
| 15                                      | BPSK | 1     | 0     | 22.82  | 23.00  | 22.69   |
| 15                                      |      | 1     | 11    | 22.84  | 22.96  | 22.71   |
| 15                                      | QPSK | 1     | 0     | 22.99  | 23.01  | 22.86   |
| 15                                      |      | 1     | 11    | 22.87  | 22.98  | 22.74   |
| 15                                      |      | 12    | 0     | 23.02  | 23.04  | 22.89   |



## Appendix B. Test Results of Radiated Test

### Radiated Spurious Emission

Sample 1:

LTE Category M1

| LTE Band 26 / 1.4MHz / QPSK |                      |                |                  |                         |                         |                          |                            |                             |                       |
|-----------------------------|----------------------|----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                     | Frequency<br>( MHz ) | ERP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>(dBm) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
| Lowest                      | 1628.14              | -63.56         | -13              | -50.56                  | -72.90                  | -66.81                   | 4.00                       | 9.40                        | H                     |
|                             | 2442.21              | -60.64         | -13              | -47.64                  | -74.08                  | -64.21                   | 4.88                       | 10.60                       | H                     |
|                             | 3256.28              | -60.39         | -13              | -47.39                  | -76.01                  | -65.32                   | 5.52                       | 12.60                       | H                     |
|                             | 1628.14              | -64.58         | -13              | -51.58                  | -73.40                  | -67.83                   | 4.00                       | 9.40                        | V                     |
|                             | 2442.21              | -59.32         | -13              | -46.32                  | -72.53                  | -62.89                   | 4.88                       | 10.60                       | V                     |
|                             | 3256.28              | -61.84         | -13              | -48.84                  | -77.11                  | -66.77                   | 5.52                       | 12.60                       | V                     |
| Middle                      | 1636.74              | -63.53         | -13              | -50.53                  | -72.87                  | -66.78                   | 4.00                       | 9.40                        | H                     |
|                             | 2455.11              | -58.55         | -13              | -45.55                  | -71.97                  | -62.12                   | 4.88                       | 10.60                       | H                     |
|                             | 3273.48              | -60.91         | -13              | -47.91                  | -76.50                  | -65.84                   | 5.52                       | 12.60                       | H                     |
|                             | 1636.74              | -63.69         | -13              | -50.69                  | -72.51                  | -66.94                   | 4.00                       | 9.40                        | V                     |
|                             | 2455.11              | -58.73         | -13              | -45.73                  | -71.94                  | -62.30                   | 4.88                       | 10.60                       | V                     |
|                             | 3273.48              | -60.90         | -13              | -47.90                  | -76.12                  | -65.83                   | 5.52                       | 12.60                       | V                     |
| Highest                     | 1645.34              | -63.64         | -13              | -50.64                  | -73.16                  | -66.89                   | 4.00                       | 9.40                        | H                     |
|                             | 2468.01              | -61.04         | -13              | -48.04                  | -74.47                  | -64.61                   | 4.88                       | 10.60                       | H                     |
|                             | 3290.68              | -60.72         | -13              | -47.72                  | -76.27                  | -65.65                   | 5.52                       | 12.60                       | H                     |
|                             | 1645.34              | -64.17         | -13              | -51.17                  | -73.17                  | -67.42                   | 4.00                       | 9.40                        | V                     |
|                             | 2468.01              | -60.05         | -13              | -47.05                  | -73.27                  | -63.62                   | 4.88                       | 10.60                       | V                     |
|                             | 3290.68              | -61.55         | -13              | -48.55                  | -76.71                  | -66.48                   | 5.52                       | 12.60                       | V                     |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



| LTE Band 26 / 3MHz / QPSK |                   |             |               |                   |                   |                    |                      |                       |                    |
|---------------------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                   | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest                    | 1628.3            | -63.87      | -13           | -50.87            | -73.21            | -67.12             | 4.00                 | 9.40                  | H                  |
|                           | 2442.45           | -60.74      | -13           | -47.74            | -74.18            | -64.31             | 4.88                 | 10.60                 | H                  |
|                           | 3256.6            | -61.13      | -13           | -48.13            | -76.75            | -66.06             | 5.52                 | 12.60                 | H                  |
|                           | 1628.3            | -64.70      | -13           | -51.70            | -73.52            | -67.95             | 4.00                 | 9.40                  | V                  |
|                           | 2442.45           | -59.35      | -13           | -46.35            | -72.56            | -62.92             | 4.88                 | 10.60                 | V                  |
|                           | 3256.6            | -61.72      | -13           | -48.72            | -76.99            | -66.65             | 5.52                 | 12.60                 | V                  |
| Middle                    | 1635.3            | -63.90      | -13           | -50.90            | -73.24            | -67.15             | 4.00                 | 9.40                  | H                  |
|                           | 2452.95           | -60.16      | -13           | -47.16            | -73.60            | -63.73             | 4.88                 | 10.60                 | H                  |
|                           | 3270.6            | -61.04      | -13           | -48.04            | -76.63            | -65.97             | 5.52                 | 12.60                 | H                  |
|                           | 1635.3            | -64.36      | -13           | -51.36            | -73.18            | -67.61             | 4.00                 | 9.40                  | V                  |
|                           | 2452.95           | -59.39      | -13           | -46.39            | -72.60            | -62.96             | 4.88                 | 10.60                 | V                  |
|                           | 3270.6            | -61.45      | -13           | -48.45            | -76.67            | -66.38             | 5.52                 | 12.60                 | V                  |
| Highest                   | 1642.3            | -63.90      | -13           | -50.90            | -73.42            | -67.15             | 4.00                 | 9.40                  | H                  |
|                           | 2463.45           | -60.29      | -13           | -47.29            | -73.71            | -63.86             | 4.88                 | 10.60                 | H                  |
|                           | 3284.6            | -59.77      | -13           | -46.77            | -75.37            | -64.70             | 5.52                 | 12.60                 | H                  |
|                           | 1642.3            | -64.36      | -13           | -51.36            | -73.36            | -67.61             | 4.00                 | 9.40                  | V                  |
|                           | 2463.45           | -60.16      | -13           | -47.16            | -73.37            | -63.73             | 4.88                 | 10.60                 | V                  |
|                           | 3284.6            | -61.45      | -13           | -48.45            | -76.68            | -66.38             | 5.52                 | 12.60                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



| LTE Band 26 / 5MHz / QPSK |                   |             |               |                   |                   |                    |                      |                       |                    |
|---------------------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                   | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest                    | 1628.5            | -64.02      | -13           | -51.02            | -73.36            | -67.27             | 4.00                 | 9.40                  | H                  |
|                           | 2442.75           | -59.70      | -13           | -46.70            | -73.14            | -63.27             | 4.88                 | 10.60                 | H                  |
|                           | 3257              | -61.52      | -13           | -48.52            | -77.15            | -66.45             | 5.52                 | 12.60                 | H                  |
|                           | 1628.5            | -64.77      | -13           | -51.77            | -73.59            | -68.02             | 4.00                 | 9.40                  | V                  |
|                           | 2442.75           | -60.08      | -13           | -47.08            | -73.29            | -63.65             | 4.88                 | 10.60                 | V                  |
|                           | 3257              | -61.66      | -13           | -48.66            | -76.94            | -66.59             | 5.52                 | 12.60                 | V                  |
| Middle                    | 1633.5            | -64.14      | -13           | -51.14            | -73.48            | -67.39             | 4.00                 | 9.40                  | H                  |
|                           | 2450.25           | -60.03      | -13           | -47.03            | -73.47            | -63.60             | 4.88                 | 10.60                 | H                  |
|                           | 3267              | -61.25      | -13           | -48.25            | -76.88            | -66.18             | 5.52                 | 12.60                 | H                  |
|                           | 1633.5            | -64.67      | -13           | -51.67            | -73.49            | -67.92             | 4.00                 | 9.40                  | V                  |
|                           | 2450.25           | -57.12      | -13           | -44.12            | -70.33            | -60.69             | 4.88                 | 10.60                 | V                  |
|                           | 3267              | -61.78      | -13           | -48.78            | -77.06            | -66.71             | 5.52                 | 12.60                 | V                  |
| Highest                   | 1638.5            | -64.12      | -13           | -51.12            | -73.64            | -67.37             | 4.00                 | 9.40                  | H                  |
|                           | 2457.75           | -61.14      | -13           | -48.14            | -74.56            | -64.71             | 4.88                 | 10.60                 | H                  |
|                           | 3277              | -61.13      | -13           | -48.13            | -76.72            | -66.06             | 5.52                 | 12.60                 | H                  |
|                           | 1638.5            | -64.37      | -13           | -51.37            | -73.37            | -67.62             | 4.00                 | 9.40                  | V                  |
|                           | 2457.75           | -60.58      | -13           | -47.58            | -73.79            | -64.15             | 4.88                 | 10.60                 | V                  |
|                           | 3277              | -61.80      | -13           | -48.80            | -77.02            | -66.73             | 5.52                 | 12.60                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

| LTE Band 26 / 10MHz / QPSK |                   |             |               |                   |                   |                    |                      |                       |                    |
|----------------------------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                    | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle                     | 1629              | -64.22      | -13           | -51.22            | -73.56            | -67.47             | 4.00                 | 9.40                  | H                  |
|                            | 2443.5            | -60.95      | -13           | -47.95            | -74.39            | -64.52             | 4.88                 | 10.60                 | H                  |
|                            | 3258              | -61.23      | -13           | -48.23            | -76.86            | -66.16             | 5.52                 | 12.60                 | H                  |
|                            | 1629              | -64.73      | -13           | -51.73            | -73.55            | -67.98             | 4.00                 | 9.40                  | V                  |
|                            | 2443.5            | -59.39      | -13           | -46.39            | -72.60            | -62.96             | 4.88                 | 10.60                 | V                  |
|                            | 3258              | -61.72      | -13           | -48.72            | -77.00            | -66.65             | 5.52                 | 12.60                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



## Sample 2:

NB-IOT Category NB1

## Band 26 / 15KHz / QPSK

| Channel | Frequency<br>( MHz ) | ERP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>(dBm) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
|---------|----------------------|----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Lowest  | 1670.36              | -64.75         | -13              | -51.75                  | -74.47                  | -68.00                   | 4.00                       | 9.40                        | H                     |
|         | 2505.54              | -59.86         | -13              | -46.86                  | -73.26                  | -63.43                   | 4.88                       | 10.60                       | H                     |
|         | 3340.76              | -62.54         | -13              | -49.54                  | -77.98                  | -67.47                   | 5.52                       | 12.60                       | H                     |
|         | 1670.36              | -65.21         | -13              | -52.21                  | -74.42                  | -68.46                   | 4.00                       | 9.40                        | V                     |
|         | 2505.54              | -58.39         | -13              | -45.39                  | -71.62                  | -61.96                   | 4.88                       | 10.60                       | V                     |
|         | 3340.76              | -62.68         | -13              | -49.68                  | -77.68                  | -67.61                   | 5.52                       | 12.60                       | V                     |
| Middle  | 1675.16              | -63.44         | -13              | -50.44                  | -73.34                  | -66.69                   | 4.00                       | 9.40                        | H                     |
|         | 2512.74              | -61.87         | -13              | -48.87                  | -75.27                  | -65.44                   | 4.88                       | 10.60                       | H                     |
|         | 3350.32              | -61.96         | -13              | -48.96                  | -77.40                  | -66.89                   | 5.52                       | 12.60                       | H                     |
|         | 1675.16              | -64.59         | -13              | -51.59                  | -73.98                  | -67.84                   | 4.00                       | 9.40                        | V                     |
|         | 2512.74              | -60.85         | -13              | -47.85                  | -74.08                  | -64.42                   | 4.88                       | 10.60                       | V                     |
|         | 3350.32              | -62.53         | -13              | -49.53                  | -77.53                  | -67.46                   | 5.52                       | 12.60                       | V                     |
| Highest | 1699.96              | -63.98         | -13              | -50.98                  | -74.06                  | -67.23                   | 4.00                       | 9.40                        | H                     |
|         | 2549.94              | -59.03         | -13              | -46.03                  | -72.45                  | -62.60                   | 4.88                       | 10.60                       | H                     |
|         | 3399.92              | -63.39         | -13              | -50.39                  | -78.00                  | -68.32                   | 5.52                       | 12.60                       | H                     |
|         | 1699.96              | -64.52         | -13              | -51.52                  | -74.10                  | -67.77                   | 4.00                       | 9.40                        | V                     |
|         | 2549.94              | -57.09         | -13              | -44.09                  | -70.25                  | -60.66                   | 4.88                       | 10.60                       | V                     |
|         | 3399.92              | -64.04         | -13              | -51.04                  | -78.14                  | -68.97                   | 5.52                       | 12.60                       | V                     |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.